

## Ghana plans for education, stewardship in GMO cowpea rollout

**A**s Ghana readies genetically modified cowpea for commercialization, proper stewardship is paramount to safeguard the responsible management of the technology, stakeholders say.

This will ensure the success of the technology after Ghana farmers obtain the seeds sometime in 2023.

Putting the right stewardship steps in place is important and necessary to avert any future failure of the Bt technology that gives the GM cowpea its ability to resist the pod borer pest, said Prof. Walter Alhassan, former director general of the Council for Scientific and Industrial Research (CSIR) and an expert in stewardship. Responsible management is needed through the entire life cycle of the Bt cowpea — from the production of seeds to cultivation by farmers — so that its promised benefits are achieved, he said.

It is particularly crucial that genuine Bt cowpea seeds are sold to farmers — not conventional ones or a mix, Alhassan said. The right packaging, along with some traceable elements, will make seed monitoring easy and help avoid problems, he noted.

“We have to make sure that farmers get genuine Bt seeds to plant, because there could be a lot of crooks in the system,” Alhassan said. “As there are no [visible] differences between the Bt cowpea seeds and other ones, farmers can’t distinguish it, not even me a scientist, unless we analyze it at the lab. They can’t just go and get it from a container or cup in the market and go to plant them like they do now. It has to be packaged properly as a certified seed, so that farmers can go to rest after the number of required sprays and not wake up to maruca pest invasion on their farms.”

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Bt cowpea has been genetically modified to provide resistance to the maruca pod borer insect, thereby drastically reducing the number of pesticides farmers required to control the insects.

Alhassan also touched on resistance management, saying that it is important to consider creating refuges or farming systems of conventional cowpea plants that maruca can use as alternate hosts. He explained that this will prevent the targeted pest from developing resistance to the Bt gene, rendering it ineffective over a period.

He was also quick to add that a second gene could be used to guard against such resistance development.

“I think SARI [Savanna Agriculture Research Institute] is already working on that,” he said. “They’ll also get a second gene which is not exposed to the insect. So even if the insect mutates against the first gene (Cry 1 Ab), the second gene will knock it out. So that’s another safety valve which is being put in place to ensure that we don’t run into this problem where we have resistant maruca pests around the place and

farmers get disappointed.”

The regulatory process followed by the National Biosafety Authority (NBA) in issuing approval is sufficiently stringent as Nigeria followed a similar process to approve the Bt cowpea, Alhassan said. However, he recommended that the NBA put post-release monitoring systems in place to ensure a smooth run of the technology. The National Varietal Release and Registration Committee (NVRRC) also needs to approve the seed quickly to prevent farmers from finding their own means of illegally obtaining the seeds, he added.

Eric Okoree, the CEO of the NBA, told the Alliance for Science that there will be periodic monitoring after the Bt cowpea seeds are finally released, multiplied and put in the hands of farmers. The Authority can only educate the public on activities under the Act followed to approve the Bt cowpea, he said, while education about responsible cultivation of the Bt cowpea relies solely with the permit holder.



Although approved by the NBA, the Bt cowpea seeds still must complete some required regulatory processes before they reach the market. Currently, SARI scientists are conducting multi-locational trials, which include 15 field trials and 100 farmer-managed trials before an application is sent to the NVRCC, for final checks and release.

Dr. Jerry Nboyine, the principal investigator for the project, told the Alliance for Science that they are following the right steps to ensure that the Bt cowpea seeds are properly released, distributed and

responsibly managed to yield the potential benefits. Structures are in place to engage particular seed companies after approval, he said. They will multiply Bt cowpea foundation seeds to produce certified seeds for farmers.

“The seeds will be properly packaged and the packaging material will come with a special code, so that anyone who buys the seed from the companies that produce them, or their retailers, can easily verify its genuineness through a QR scan or a shortcode SMS,” Nboyine said. “The way we are going to do it will be so unique that anyone who produces adulterated seeds cannot produce the QR code and straight away you will know it’s not the Bt material.”

He revealed that they will work closely with the extension department of the Ministry of Food and Agriculture to form stewardship management teams in areas where the Bt cowpea will be cultivated so as to easily trace any complaints by farmers about the seeds to the production company responsible.

Reacting to the issue of insect-resistance, Nboyine said an elaborate program will be launched with the Extension Officers of the Ministry of Food and Agriculture in cowpea growing communities to educate farmers on the responsible use of the technology to prevent the maruca insects from developing resistance to the GM technology.

“If the product is not responsibly handled, issues of insect resistance can set in, so we need to train the farmers to know the importance of having refuges to delay resistance development,” he said. “They need to understand that the GM technology is not a silver bullet but has to be handled responsibly to delay resistance development or stop it altogether. In addition, we will include grower manuals in the seed bags to provide some education on how the seeds are to be grown to yield their maximum benefits.”

Nboyine confirmed that work is under way to introduce a second gene (Cry 2 Ab) to the planting material to serve as a long term strategy to guard against maruca developing resistance.

He noted that they have also taken a cue from Nigeria by putting together a seed multiplication strategy so that seeds will be readily accessible to farmers the moment they are released.

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